

HW: TBA

Check:-

$$\frac{x^{-1} + y^{-1}}{x^{-1} - y^{-1}}$$

$$= \frac{\frac{\frac{x}{y}}{1} + \frac{\frac{1}{y}}{\frac{x}{x}}}{\frac{\frac{x}{y}}{1} - \frac{\frac{1}{y}}{\frac{x}{x}}} \quad \text{LCD: } xy$$

$$\frac{y}{xy} + \frac{x}{xy} \Rightarrow \frac{y+x}{xy}$$

$$\frac{y}{xy} - \frac{x}{xy} \Rightarrow \frac{y-x}{xy}$$

$$\frac{y+x}{\cancel{xy}} \cdot \frac{\cancel{xy}}{y-x} = \boxed{\frac{y+x}{y-x}}$$

1)  $\frac{\frac{x \cdot 3}{x \cdot 2} + \frac{3 \cdot 2}{x \cdot 2}}{\frac{x \cdot 2}{x \cdot 1} + \frac{4}{x}}$   $\text{LCD} = 2x$   $\frac{3x}{2x} + \frac{6}{2x} \Rightarrow \frac{3x+6}{2x}$

$\frac{2x}{x} + \frac{4}{x} \Rightarrow \frac{2x+4}{x}$

$$\frac{3x+6}{2x} \cdot \frac{\cancel{x}}{2x+4} = \frac{3x+6}{4x+8} = \frac{3\cancel{(x+2)}}{4\cancel{(x+2)}} = \left(\frac{3}{4}\right)$$

2)

$$\frac{\frac{x \cdot 5}{x \cdot 2} + \frac{4 \cdot (2)}{x \cdot (2)}}{\frac{4x \cdot 1}{4x \cdot 1} + \frac{3}{4x}} \quad \text{LCD: } 2x \quad \frac{5x}{2x} + \frac{8}{2x} \Rightarrow \frac{5x+8}{2x}$$

$$\frac{4x}{4x} + \frac{3}{4x} \Rightarrow \frac{4x+3}{4x}$$

$$\frac{5x+8}{\cancel{2x}^1} \cdot \frac{\cancel{4x}^2}{4x+3} = \frac{10x+16}{4x+3}$$

$$3) \frac{xy^{-1} + 1}{2 + x^{-1}}$$

$$\frac{\cancel{x} \frac{1}{y} + \frac{1}{1}}{\quad} \quad \text{LCD} = y$$

$$\frac{x}{y} + \frac{y}{y} \Rightarrow \frac{x+y}{y}$$

$$\frac{\frac{x}{\cancel{x}} \frac{2}{1} + \frac{1}{x}}{\quad} \quad \text{LCD} = x$$

$$\frac{2x}{x} + \frac{1}{x} \Rightarrow \frac{2x+1}{x}$$

$$\frac{x+y}{y} \cdot \frac{x}{2x+1} = \frac{\frac{x^2 + xy}{2xy + y}}{\quad}$$

23)  $\frac{\frac{w+1}{w+2} - \frac{1}{w+2}}{\frac{w-2}{w-2} - \frac{6}{w-2}}$  LCM:  $w+2$   $\frac{w+1}{w+2} - \frac{1}{w+2} \Rightarrow \frac{w+1}{w+2}$

$\frac{w-2}{w-2} - \frac{6}{w-2}$  LCM:  $w-2$   $\frac{w^2-3w+2}{w-2} - \frac{6}{w-2} \Rightarrow \frac{w^2-3w-4}{w-2}$

$\frac{(w-2)(w-1)}{w^2-1w-2w+2}$

$\frac{\cancel{w+1}}{w+2} \cdot \frac{w-2}{\cancel{w^2-3w-4} = \frac{w-2}{(w+2)(w-4)}}$